

SF LAB II
Experiment 3

Submitted by
Aman Borkar

22CS06014

MTECH (CSE)

Under the supervision of

Dr. MANORANJAN SATPATHY



School of Electrical Science
INDIAN INSTITUTE OF TECHNOLOGY, BHUBANESWAR

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ALGORITHM

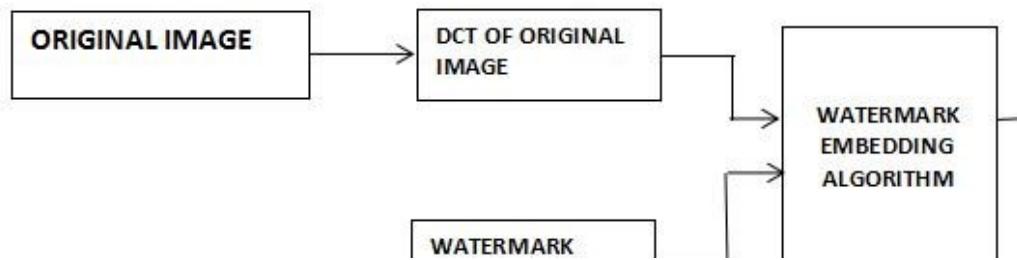
EMBEDDING THE WATERMARK:

- At first both the original image and the watermark image are resized and then converted to array using `convert_image()` function.
- Then Discrete Cosine Transform is applied on the original image using the `apply_dct()` function.
- Watermark is embedded in the array obtained after applying `apply_dct()` function on the original image. Each bit of watermark is embedded in the index [5][5] of the sub-block of size 8*8.
- Then inverse DCT is performed to convert the image from frequency domain to spatial domain and the corresponding array is converted to image and stored with name “`image_with_watermark`”.

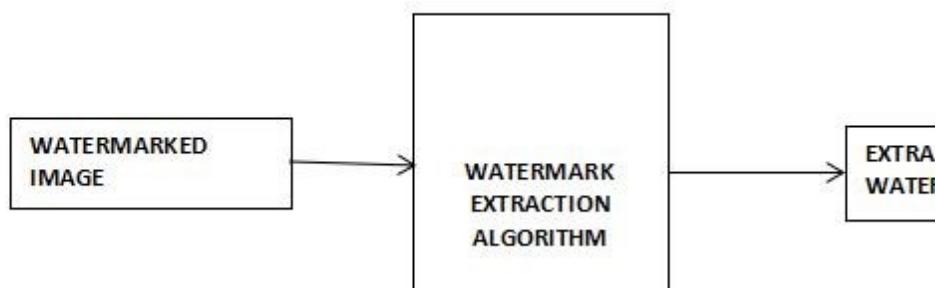
EXTRACTING THE WATERMARK

- At first DCT is applied on the image array.
- Then watermark is extracted bit wise from the index [5][5] of each sub-block as in those corresponding indices only the watermark was embedded.
- Thus the watermark is extracted successfully.

FLOWCHART



Watermark embedding



Watermark extraction

OUTPUT

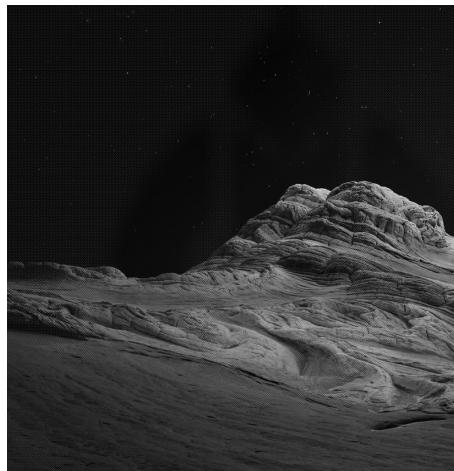
Input image 1:



Watermark image 1



Image 1 with watermark 1



Recovered watermark 1



Input image 2:



Watermark image 2



Image 1 with watermark 2

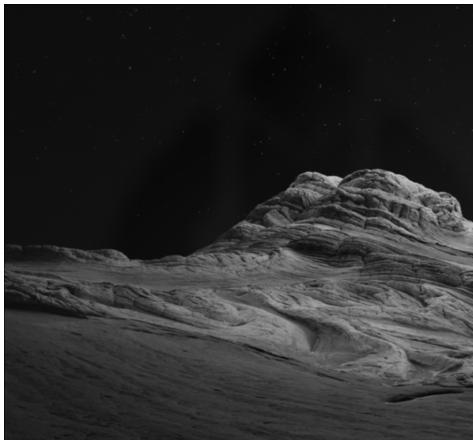


Recovered watermark 2



ATTACKS

Image 1 after average filter attack



Average filter recovered watermark

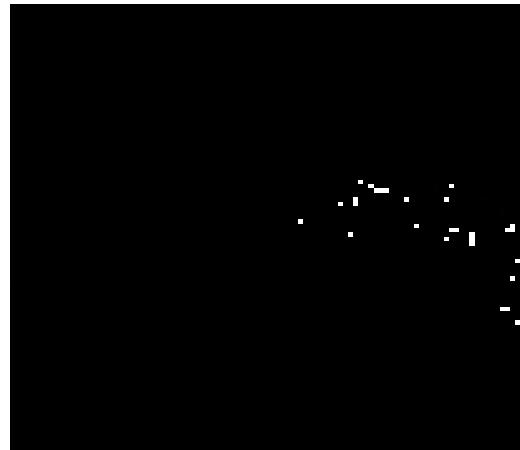


Image 1 after median filter attack



Median filter attack recovered watermark

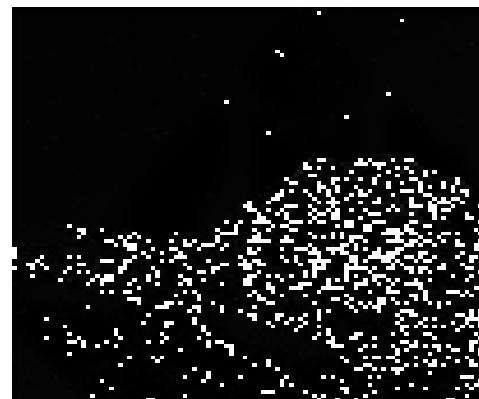
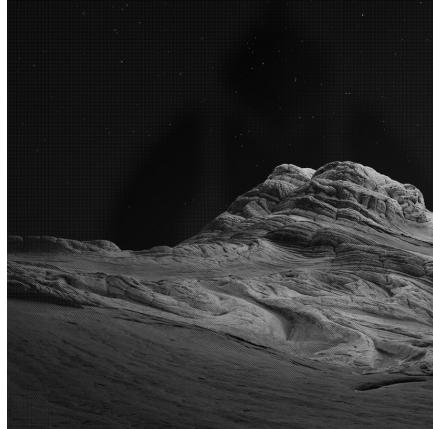


Image 1 after cropping attack



Cropping attack recovered watermark

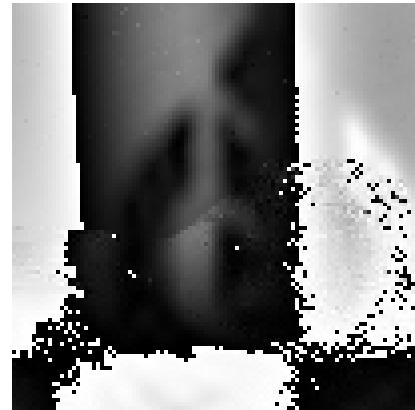


Image 1 after rotation attack



Rotation attack recovered watermark

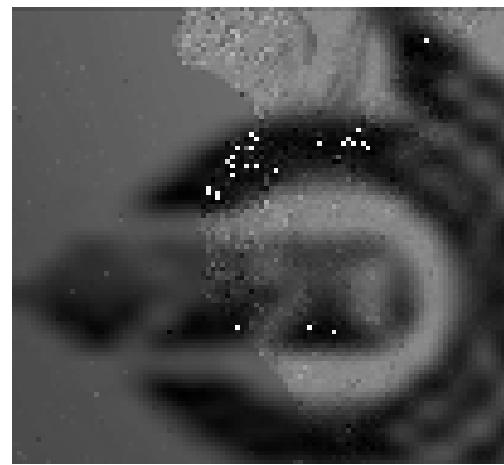


Image 2 after average filter attack



Average filter recovered watermark



Image 2 after median filter attack



Median filter attack recovered watermark

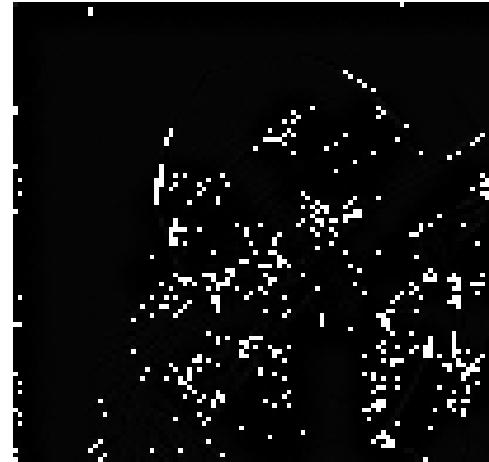
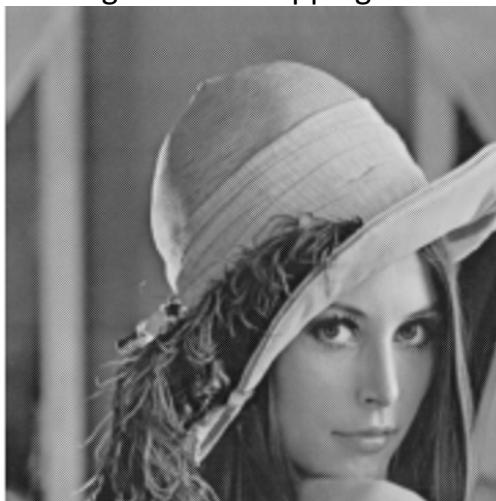


Image 2 after cropping attack



Cropping attack recovered watermark

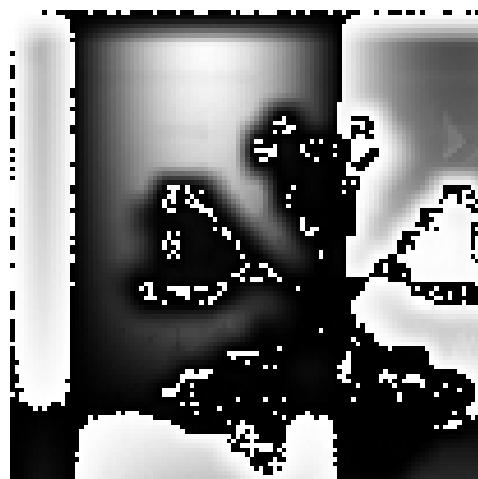
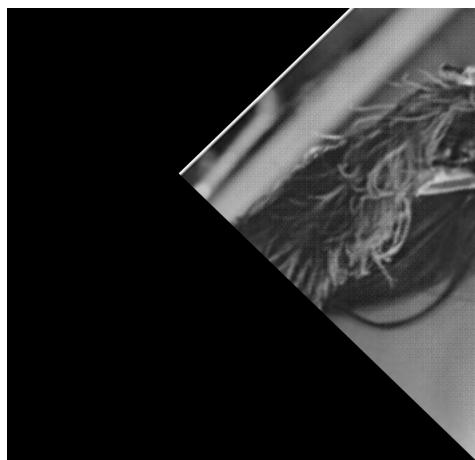
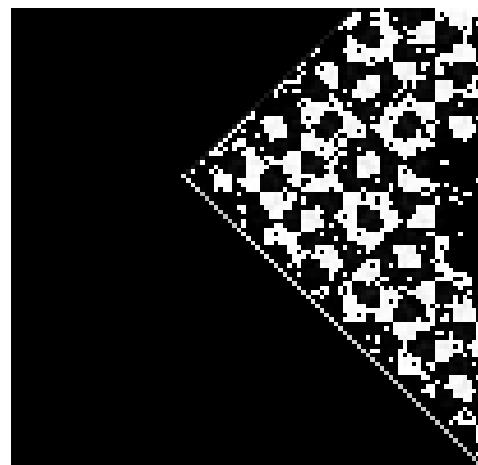


Image 2 after rotation attack



Rotation attack recovered watermark



CODE

https://colab.research.google.com/drive/1X1s5r0cFn9bO_A0aJ-B5OFk3SWwJYf3U?usp=sharing